

B² 23. (Amended) A granulate according to claim 22 [wherein: (a) the] comprising a derivatised cellulose [is] selected from the group consisting of hydroxy-propyl-methyl-cellulose, carboxy-methyl-cellulose and hydroxy-ethyl-cellulose[; (b) the edible oil is soy oil or canola oil; or (c) the derivatised cellulose is as according to (a) and the edible oil is as according to (b)].

39. A granulate according to claim 22 comprising an edible oil selected from the group consisting of soy oil and canola oil.

B³ Jul 31 40. A granulate according to claim 22 comprising a derivatised cellulose selected from the group consisting of hydroxy-propyl-methyl-cellulose, carboxy-methyl-cellulose and hydroxy-ethyl-cellulose and an edible oil selected from the group consisting of soy oil and canola oil.

REMARKS

The Pending Claims

Claims 18-28 and 31-35 were pending in this application when the office action was issued. The foregoing amendment adds new claims 39 and 40.

The Office Action

In the office action mailed March 16, 2000, the Examiner noted that the specification included the trademarks "S SEPHAROSE FAST FLOW," "Q SEPHAROSE FAST FLOW," "STIRRED CELL" and "MARUMERISER," pointing out that the trademarks should be capitalized and accompanied by generic terminology wherever used. Applicants acknowledge the Examiner's comments and will make all such corrections to the specification upon notification of allowable subject matter.

The Examiner objected to claim 23 as being written in improper dependent form for failing to further limit the base claim from which it depends. Additionally, the Examiner rejected claim 18 under 35 U.S.C. § 112 as indefinite, based on the use of the term "processing" and also based on the use of "FTU/g" to report the concentration of the phytase solution.

The Examiner rejected claims 18, 19, 21, 22, 25-28 and 31-35 under 35 U.S.C. § 103 as obvious over Hamstra in view of Nevalainen and Jane, arguing that Hamstra teaches a method of making feed pellets by adding phytase to the pellets. While the Examiner acknowledged that Hamstra does not teach the composition of the pellets, beyond stating that they are composed of an edible material, the Examiner argued that Nevalainen teaches a highly active *A. niger* phytase and

the use of phytases in animal feed, while Jane teaches as composition comprising a starch aldehyde and polyvinyl alcohol that may be pelleted for use as an animal feed. Jane does not teach the use of a phytase.

Additionally, the Examiner rejected claim 20 under § 103 as obvious over Hamstra, Nevalainen and Jane, further in view of Overton, arguing that Overton teaches the use of calcium in animal feed.

Finally, the Examiner rejected claim 20 under § 103 as obvious over Hamstra, Nevalainen and Jane, further in view of Bedford, arguing that Bedford teaches a feed additive comprising xylanase, β -glucanase and phytase.

The Claim Amendments

Claims 18 and 19 have been amended to more clearly define the scope of the invention. Claim 23 has been amended to place the claim in proper dependent form. Finally, claims 39 and 40 have been added to separately recite elements that had been included in claim 23, and that formed the basis for the Examiner's objection to the dependent form of claim 23. These amendments do not include new matter.

Response to Office Action

Section 112 Rejections

The Examiner has rejected claim 18 under 35 U.S.C. § 112, based on the use of the terms "processing" and "FTU/g." Applicants have amended claim 18 to remove the term "processing," replacing it with "mixing." However, Applicants respectfully submit that the use of "FTU/g" to report the phytase activity is appropriate and sufficiently clear to convey to one of ordinary skill in the art that the weight referred to in "FTU/g" is the weight of the aqueous phytase solution and not the specific activity of the phytase. Example 4 refers to a phytase liquid that has a specific activity of 100 FTU/mg, which results in a phytase activity of 28,000-30,000 FTU/g, clearly differentiating between the phytase activity in a given weight of aqueous solution and the specific activity of the phytase itself (*see* p. 19, lines 26-27). Indeed, one of ordinary skill reading the specification as a whole would reach this conclusion.

Moreover, the units FTU/ml and FTU/g are not equivalent, because the density of the 14,000 FTU/g aqueous phytase liquid is not the same as water; the density of the phytase solution is approximately 1.1g/ml. In summary, Applicants submit that one of ordinary skill in the art would

understand that the units FTU/g refer to the activity of phytase in a given amount of the aqueous solution, as measured by weight (in grams). Accordingly, Applicants request that the rejection of claim 18 under § 112 be withdrawn.

Section 103 Rejections

Applicants respectfully traverse the Examiner's rejection of the pending claims under section 103, as none of the cited references, taken alone or in combination, teaches or suggests the claimed invention.

Hamstra involves feed pellets, but does nothing more than mention phytase as an example of enzymes that may be included in the pellets. Hamstra teaches nothing concerning the activity of the phytase and, as the Examiner correctly notes, teaches nothing about the composition of the pellets, other than to state that they comprise edible material.

The Examiner relies on Nevalainen to overcome the shortfalls of Hamstra, but Nevalainen also falls far short of teaching or suggesting the claimed invention. Nevalainen reports phytase activity in "phytase units" (PU), defined as "the amount of enzyme which liberates, under standard conditions, 1 nmol of inorganic phosphate from sodium phytate in one minute" (p. 28, lines 7-9). In contrast, the specification of the present application reports phytase activity in "FTU", defined as the amount of enzyme which liberates 1 μ mol of phosphate in one minute (p. 4, lines 19-21). Both units are based substantially on the same conditions of temperature, pH and phytate concentrations (*see* Nevalainen, p. 28, lines 10-14 and the instant specification at p. 4, lines 19-21). Therefore, 1 FTU essentially equals 1000 PU.

The highest phytase activity disclosed by Nevalainen is 4486680 PU, in the crude culture filtrate, for which no volume is specified (*see* p. 38, Table 1). Therefore, the highest phytase activity that may be compared to the present invention is the ammonium sulfate precipitation supernatant, 3771750 PU in 990 ml, or approximately 3800 PU/ml. This activity correlates to approximately 3.8 FTU/ml. Although, as discussed above, the correlation between FTU/ml and FTU/g is not exact, the activity disclosed by Nevalainen is several orders of magnitude lower than the minimum phytase activity claimed by Applicants, 14,000 FTU/g. Accordingly, Nevalainen cannot be said to teach or suggest the claimed invention.

Likewise, Jane fails to fill in the gaps in Hamstra and Nevalainen. Jane discloses a composition comprising a starch aldehyde and less than 50% (w/w) of polyvinyl alcohol. Jane does

not disclose a feed pellet containing an enzyme, as the Examiner acknowledges. In fact, if one were to attempt formulating an enzyme-containing feed pellet following Jane's teaching, the result would be cross-linking of the enzyme to the starch aldehyde during processing of the mixture. (see col. 1, line 59 – col. 2, line 2; col. 2, lines 59-66). Such cross-linking would inactivate the enzyme, thus rendering Jane's composition unusable for feed compositions that require an active enzyme, such as the claimed composition.

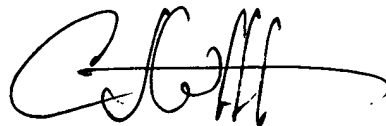
In view of the foregoing, Applicants respectfully submit that the combination of Hamstra, Nevalainen and Jane cannot be said to teach or suggest the claimed invention and, therefore, Applicants request that the rejection of claims 18, 19, 21, 22, 25-28 and 31-35 based on those references be withdrawn. Similarly, given the failure of the three primary references to teach or suggest the claimed invention, claims 20 and 24 cannot be considered obvious over these references, even in view of Overton and Bedford, neither of which discloses, teaches or suggests a phytase-containing feed pellet having phytase activity of 14,000 FTU/g, as the Examiner acknowledges.

Conclusion

The application is considered in good and proper form for allowance. If there are any questions or comments regarding this Response or application, the Examiner is encouraged to contact the undersigned attorney as indicated below.

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Respectfully submitted,



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